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INK JET RECORDING PAPER

[Claim(s)]

[Claim 1]An ink jet recording sheet with which it is the ink jet recording sheet which provided a coating layer which contains paints by the cast coating method in at least one field of a base paper, and said paints are characterized by containing 50% of the weight or more of calcium carbonate compound silica.

[Claim 2]The ink jet recording sheet according to claim 1 which specific surface area according [calcium carbonate compound silica] to a BET adsorption method is below $100\text{-m}^2/\text{g}$, and is characterized by mean particle diameter being 4 micrometers or less.

[Detailed Description of the Invention]

[0001]

[Industrial Application] This invention relates to the ink jet recording sheet which fitted formation of the high definition full color image especially about an ink jet recording sheet.

[0002]

[Description of the Prior Art] Since it is a method which an ink jet recording method makes the glob of ink breathe out with various mechanisms, makes the ink glob adhere to a record paper, forms a dot, and performs image recording, Since the development and fixing with easy full-color-izing with little noise at the time of record are unnecessary, speed recording is possible and it has the features, like it is. Therefore, it is observed as a method (hard copy) of copying the color picture displayed on the cathode-ray tube etc. or various figures, a color copy, etc. as it is, and has spread quickly in recent years. However, according to diversification of needs, especially the demand to enlargement, improvement in the speed, highly minute-izing of a recorded image, etc. is growing.

[0003] Then, the following various characteristics are demanded from the ink jet recording sheet (only henceforth a recording form) from a viewpoint over such needs.

- (1) Without the ink adhering to a recording form flowing, be absorbed and the absorbed ink should not spread.
- (2) The concentration of an ink dot is high and the color tone be skillful.
- (3) The breadth to the direction of space of an ink dot is moderate, and a dot is close to a perfect circle, and this end be sharp.
- (4) In order to obtain the recorded image in which it is clear and appearance is good, the smooth nature of space and glossiness be excellent.
- (5) A recorded image should have a water resisting property (when moisture adheres to the recorded image on space, the outflow of a blot or a color does not arise in the ink dot which forms this picture).

[0004] Containing, and making a coating layer contain the silica powder of an ink absorbency high non-colloid conventionally, in order to improve the problem of the above (1) is performed. (For example, JP,55-51583,A) was insufficient in smooth nature, glossiness, and a water resisting property, although the ink absorbency of a recording form has been improved in this case.

[0005] How to hang a super calender and gross KAREDA on the surface of a recording form, and finish the surface smoothly as a method of improving the smooth nature of a recording form, and glossiness. (For example, JP,57-167879,A) A recording form is made

to contain the particles of thermoplastics or thermoplastics, How to process this record paper face using the plasticizer and/or organic solvent which apply heat and a pressure to this record space, or can dissolve or swell thermoplastics after printing on this recording form. (For example, JP,53-50744,A, JP,59-196285,A, JP,59-201891,A, JP,59-204591,A, JP,59-204592,A, and JP,59-222381,A) etc. -- it is proposed.

[0006]However, while these methods could improve the smooth nature of a recording form, and glossiness, they had the fault of reducing the absorptivity of ink. If it is in the method of making a recording form containing the above-mentioned thermoplastics etc. especially, since the processing after record becomes complicated, improvement in the speed becomes difficult, and also there was a fault of raising the manufacturing cost of a recorder.

[0007]On the other hand, the method of making a recording form contain basic oligomer is proposed as a method of raising the water resisting property of a recorded image (for example, JP,60-11389,A). In this case, although a water resisting property is improved, when carrying out coating of the basic oligomer to a recorded image, a lot of water adheres to a base paper. Therefore, wrinkles went into the recording form, or it was lenticulated and made it, and there was a fault that a recorded image became hard to see.

[0008]It is considered as the method of improving any problems, such as the smooth nature of a record paper face, glossiness, the water resisting property of a recording form, with ink absorbency, the manufacturing method of the ink JIETO record paper using the manufacturing method of cast coated paper is proposed (JP,61-209189,A.) JP,62-95285,A, JP,63-211394,A, JP,63-264391,A, Provisional Publication No. No. 265680 and JP,1-95214,A, and a good result are dedicated. However, in order to obtain a full color recorded image with high definition and high gradation nature also in this case, there was a fault that it was not yet enough in the concentration, sharpness, and perfect circle nature of a dot.

[0009]

[Problem(s) to be Solved by the Invention]In order that this invention persons may solve the above-mentioned fault, as a result of inquiring wholeheartedly, in the coating layer provided by the cast coating method on the surface of the base paper, By using together with other paints by using calcium carbonate compound silica of a specific amount as paints, it found out that a good result can be obtained and this invention was reached.

[0010]Therefore, the purpose of this invention is excellent in ink absorbency, the smooth nature of a record paper face and glossiness, and the water resisting property of a recording form, and also is excellent in the concentration of a dot, sharpness, and

perfect circle nature, and there is in providing an ink jet recording sheet suitable for recording a full color picture with high definition and high gradation nature.

[0011]

[Means for Solving the Problem]The above-mentioned purpose of this invention is the ink jet recording sheet which provided a coating layer which contains paints by the cast coating method in at least one field of a base paper, Said paints were attained by ink jet recording sheet containing 50% of the weight or more of calcium carbonate compound silica.

[0012]Calcium carbonate compound silica (CaCO_3 and $n\text{SiO}_2$) used by this invention, It can obtain easily by blowing carbon dioxide (CO_2) into a calcium silicate ($\text{CaO} \cdot n\text{SiO}_2$) produced by making a calcium chloride (CaCl_2) react to sodium silicate ($\text{Na}_2\text{O} \cdot n\text{SiO}_2$).

[0013]in addition -- setting to this invention, although a ratio of calcium carbonate compounded with silica can be suitably prepared with an addition of a calcium chloride -- especially -- calcium carbonate -- CaO conversion -- 15-25·mol % -- it is preferred to use introduced calcium carbonate compound silica.

[0014]In this invention, since mean particle diameter of compound silica to be used is so good that it is small from a viewpoint of raising sharpness and concentration of a dot, as for this mean particle diameter, it is preferred that it is 4 micrometers or less, and it is preferred that it is especially 3 micrometers or less. Here, the above-mentioned mean particle diameter means mean particle diameter of secondary aggregation particles of compound silica, and means mean particle diameter specifically measured by a Coulter counter particle-size-distribution measuring instrument.

[0015]In this invention, it is in a tendency for concentration of a dot to become high, so that specific surface area of calcium carbonate compound silica to be used becomes small. Therefore, as for specific surface area of compound silica measured with a BET adsorption method from a viewpoint of obtaining a good recorded image with story tonality, it is preferred that it is below $100\text{-m}^2/\text{g}$, and it is especially preferred that it is below $80\text{-m}^2/\text{g}$.

[0016]In this invention, although it is required to make paints contain in a coating layer, to use the above-mentioned calcium carbonate compound silica as paints, and to use it 50% of the weight or more into these paints, it is preferred to use it especially 80% of the weight or more.

[0017]Since take for making it increase content of the above-mentioned compound silica, and concentration of a dot becomes high, and sharpness also becomes good and it becomes good [perfect circle nature], can obtain a recorded image outstanding in this case, but. When it is considered as 50 or less % of the weight of content, a case where

concentration of a dot becomes insufficient and it is inferior to the reproducibility of a color from an original copy arises.

[0018]In this invention, paints in particular that can be used together with the above-mentioned calcium carbonate compound silica are not limited, they can choose suitably paints used for the usual paper coating, and they can be used for them. As the above-mentioned paints, organic colors, such as inorganic pigments, such as synthetic silica, kaolin, talc, calcium carbonate, aluminium hydroxide, a titanium dioxide, and a satin white, and a plastic pigment, can be mentioned, for example. Especially synthetic silica is preferred also in these.

[0019]When the above-mentioned synthetic silica is used, if synthetic large silica of specific surface area is used, ink absorbency can be improved, and dot concentration can be made high if what has small opposite side specific surface area is used. It can perform making a coating layer contain the above paints easily by making coating liquid mix and distribute these paints by a publicly known method.

[0020]In this invention, a binding property with a base paper is given to paints, and in order to form a coating layer uniformly, a binder is added in coating liquid. As an example of the above-mentioned binder, starch, such as oxidation starch and esterification starch. Cellulosics, such as carboxymethyl cellulose and hydroxyethyl cellulose, Polyvinyl alcohol and its derivative, casein, gelatin, soybean protein, styrene maleic acid resin and its derivative, styrene butadiene series latex, vinyl acetate system emulsions, or two or more sorts of these mixtures can be mentioned.

[0021]To paints 100 weight section, quantity of a binder used can usually be suitably adjusted according to a kind of paints and quantity of paints to be used, although it is 20 to 80 weight section. In coating liquid, a pigment agent, a water retention agent, a thickener, a **** agent, a release agent, an antiseptic, a color pigment, a water resistance-ized agent, a wetting agent, fluorescent dye, an ultraviolet ray absorbent, etc. can be added if needed.

[0022]In this invention, in order to raise the water resisting property of a recorded image, it is preferred to make a coating layer contain cationic polymers. A $\text{-SO}_3\text{Na}$ group in a water-soluble direct color in ink in which such a cationic polymer electrolyte is used, or an acid dye molecule, - It reacts to an SO_3H basis, a -NH_2 group, etc., form a salt insoluble to water, prevent a color in ink from dissolving in water, and raise the water resisting property of a recorded image.

[0023]As the above-mentioned cationic polymer electrolyte, for example Polyvinylbenzyl trimethyl ammonium halide, PORIJI acrylic dimethylannmonium halide, a poly dimethylaminoethyl methacrylate hydrochloride, Polyethyleneimine, dicyandiamide

formalin condensate, epichlorohydrin denaturation poly alkylamine, polyvinyl pyridinium halide, polyethyleneimine quarternary ammonium salt, polyamine, etc. can be mentioned.

[0024] Coating liquid prepared as mentioned above is applied to a base paper by a coating method the roll coater method, the air knife coater method, the braid coating-machine method, the curtain coating-machine method, the bar coating-machine method, the photogravure coating-machine method, the comma coating-machine method, etc. are publicly known. Although a coating amount is made into $5 \sim 50 \text{ g/m}^2$ by solid content conversion per one side of a base paper, it is usually preferred to consider it as $10 \sim 30 \text{ g/m}^2$ especially. As for paints, it is preferred to consider it as $3 \sim 30 \text{ g/m}^2$.

[0025] In this invention, a coating layer is provided in a base paper by the cast coating method. The above-mentioned cast coating methods are a method of manufacturing the usual cast coating paper, and same method.

[0026] Namely, the wet cast coating method which makes a heated drum which has the cylinder outside by which mirror surface finish was carried out to a coating layer of a damp or wet condition provided in the base paper surface in this invention weld by pressure, and finishes a paper face in the shape of gloss, The gelling cast coating method which makes a heated drum which has the cylinder outside by which mirror surface finish was carried out after making into the gel state a coating layer of a damp or wet condition provided in the base paper surface weld by pressure, and finishes a paper face in the shape of gloss, To and a coating layer which you were made to plasticize by applying re-moist liquid once drying a coating layer of a damp or wet condition provided in the base paper surface. A coating layer is provided by which method of the RIUETTO cast coating method which makes a heated drum which has the cylinder outside by which mirror surface finish was carried out weld by pressure, and finishes a paper face in the shape of gloss.

[0027] A base paper in particular used for this invention is not limited, and publicly known papers, such as alkaline paper which made a subject wood pulp usually used for an ink jet recording sheet, can be used for it, choosing them suitably.

[0028]

[Effect of the Invention] Since the ink jet recording sheet of this invention contains the paints which contain the calcium carbonate compound silica of a specific amount in the coating layer provided on the surface of the base paper by the cast coating method, It excels in ink absorbency, smooth nature, glossiness, and a water resisting property, and is suitable for recording a full color picture with high definition and high gradation nature.

[0029]

[Example] This invention is not limited by this, although an example is given below and this invention is explained further in full detail. A "weight section" and "% of the weight" are shown respectively, which shows the "part" which shows an addition, and content.

[0030] 100 copies of calcium carbonate compound silica whose mean particle diameter specific surface area is 2.8 micrometers in 60-m²/g as example 1. paints (fine seal CM-F: trade name by Tokuyama Soda Co., Ltd.), 20 copies of colloidal silica (snow textile N: trade name by Nissan chemicals incorporated company), As a binder, 30 copies of styrene butadiene series latex (JSR-0801: trade name by Japan Synthetic Rubber Co., Ltd.), Two copies of calcium stearates (NOPUKOTO C-104: trade name by Sannopuko, Inc.) were respectively added as 30 copies of casein (RAKUCHIKKU casein: trade name from New Zealand), and a release agent, it mixed, and 30% of coating liquid was prepared with solids concentration.

[0031] Coating of the obtained coating liquid was carried out to the coat stencil paper of basis weight 90 g/m² by the roll coater so that it might become 17 g/m² by solid content, and the coating layer was provided. As a coagulant, coating of the solution which contains polyethyleneimine quarternary ammonium salt which is a cationic polymer electrolyte as a water resistance-ized agent 3% in 10% of calcium formate solution was carried out to the paper (it is called coated paper) which provided the obtained coating layer by the roll coater, and coagulation processing was performed on it.

[0032] Subsequently, while the coating layer of the obtained coated paper was in the damp or wet condition, the mirror plane of the cast drum heated by 100 °C was welded by pressure to the coating layer side, this coating layer was dried, and the ink jet recording sheet of this invention was obtained. It evaluated using the obtained record paper by doing the following physical properties and an ink-jet-recording-suitability examination. A result is as having been shown in Table 2.

[0033] (1) With physical-properties examination ** 75-degree specular gloss JIS-Z8741 measuring method of the record paper, it measured using gloss meter GM26D (trade name of the brilliance test machine by Murakami color incorporated company).

** The smoothness smoothness/J. TAPPI-A method testing machine (trade name by Asahi Seiko CO., LTD.) was used and measured.

[0034] (2) Heavy printing of the record fitness ** ink absorbency color ink of an ink jet recording sheet was performed, the solid printing unit immediately after printing was ground against the finger, and the grade of tailing of ink was observed by viewing and evaluated. The valuation basis is as follows.

O : the best O:good **: Slightly poor x: Defect [0035]** Five reflection density was measured using dot concentration Konica microdensitometer PDM-5 (trade name by Konica Corp.), and the average value of five points was made into dot concentration.

** The dot circumference oozed out using the sharpness stereoscopic microscope of a dot, and the state was observed and evaluated. The valuation basis is as follows.

O : -- good Thing **: -- oozing out somewhat -- thing of a degree x: having oozed out -- poor thing [0036]** The path and perfect circle nature image analyzer (trade name by ADS incorporated company) of the dot were used, and the average value of the path equivalent to the circle of the dot of 16 points was made into the dot diameter. The circularity coefficient of the dot of 16 points was calculated with the following expression, and the average value was made into the perfect circle nature of a dot, and was evaluated. It is shown that it is so close to a perfect circle that a circularity coefficient is [one] near.

Circularity coefficient = $P / (\text{area} \times 4\pi)$

(However, P is a boundary length of a dot and area is the area of a dot)

[0037]The color ink jet printer of the continuous method using each water-based ink of the cyanogen, the magenta, the yellow, and black which are marketed performed formation of the dot. Dot concentration, the dot diameter, and the number of circularity systems showed the value of the cyanogen ink part. 60-70 micrometers and the circularity coefficient of dot concentration are desired values in which 0.70 or more are preferred as for 0.80 or more and a dot diameter.

[0038]60 copies of calcium carbonate compound silica whose mean particle diameter specific surface area is 2.8 micrometers in 80-m²/g as example 2. paints (fine seal CM-F: trade name by Tokuyama Soda Co., Ltd.), 40 copies of precipitated calcium carbonate (TAMAPARU 121: trade name by Okutama Industries), 20 copies of colloidal silica (snow textile N: trade name by Nissan chemicals incorporated company), As a binder, 30 copies of styrene butadiene series latex (JSR-0801: trade name by Japan Synthetic Rubber Co., Ltd.), Two copies of calcium stearates (NOPUKOTO C-104: trade name by Sannopuko, Inc.) were respectively added as 30 copies of casein (RAKUCHIKKU casein: trade name from New Zealand), and a release agent, it mixed, and 40% of coating liquid was prepared with solids concentration.

[0039]Coating of the obtained coating liquid was carried out by the roll coater so that it might become the coat stencil paper of basis weight 90 g/m² with 20 g/m² by solid content, and the coating layer was provided. Coating of the solution which contains polyethyleneimine quarternary ammonium salt which is a cationic polymer electrolyte as a water resistance-ized agent 3% was carried out to 10% of calcium formate solution

by the roll coater as a coagulant, and coagulation processing was performed to the obtained coated paper.

[0040]Subsequently, while the coating layer of the obtained coated paper was in the damp or wet condition, the mirror plane of the cast drum heated by 100 °C was welded by pressure to the coating layer side, this coating layer was dried, and the ink jet recording sheet of this invention was obtained. Using the obtained record paper, it examined completely like Example 1 and evaluated. A result is as having been shown in Table 2.

[0041]Example 3. specific surface area replaces with the 80 copy 60 copies of calcium carbonate compound silica (fine seal CM-F: trade name by Tokuyama Soda Co., Ltd.) whose mean particle diameter is 2.8 micrometers in 80-m²/g, 40 copies of precipitated calcium carbonate (TAMAPARU 121: trade name by Okutama Industries) was changed into the 20 copy, and also the ink jet recording sheet of this invention was produced completely like Example 2, and it examined completely like Example 1 and evaluated. A result is as having been shown in Table 2.

[0042]80 copies of calcium carbonate compound silica whose mean particle diameter specific surface area is 2.8 micrometers in 80-m²/g as example 4. paints (fine seal CM-F: trade name by Tokuyama Soda Co., Ltd.), By specific surface area 2[of 270 m²/g, 20 copies of general formless composition silica with a mean particle diameter of 2.8 micrometers (fine seal X-37B: trade name of Tokuyama Soda Co., Ltd.), 20 copies of colloidal silica (snow textile N: trade name by Nissan chemicals incorporated company), As a binder, 30 copies of styrene butadiene series latex (JSR-0801: trade name by Japan Synthetic Rubber Co., Ltd.), Two copies of calcium stearates (NOPUKOTO C-104: trade name by Sannopuko, Inc.) were respectively added as 30 copies of casein (RAKUCHIKKU casein: trade name from New Zealand), and a release agent, it mixed, and 28% of coating liquid was prepared with solids concentration.

[0043]Coating of the obtained coating liquid was carried out by the roll coater so that it might become the coat stencil paper of basis weight 90 g/m² with 17 g/m² by solid content, and the coating layer was provided. Coating of the solution which contains polyethyleneimine quarternary ammonium salt which is a cationic polymer electrolyte as a water resistance-ized agent 3% was carried out to 10% of calcium formate solution by the roll coater as a coagulant, and coagulation processing was performed to the obtained coated paper.

[0044]Subsequently, while the coating layer of the obtained coated paper was in the damp or wet condition, the mirror plane of the cast drum heated by 100 °C was welded by pressure to the coating layer side, this coating layer was dried, and the ink jet

recording sheet of this invention was obtained. Using the obtained record paper, it examined completely like Example 1 and evaluated. A result is as having been shown in Table 2.

[0045]Example 5. specific surface area replaces with the 60 copy 80 copies of calcium carbonate compound silica (fine seal CM-F: trade name by Tokuyama Soda Co., Ltd.) whose mean particle diameter is 2.8 micrometers in 80-m²/g, Replaced 20 copies of general formless composition silica (fine seal X-37B: trade name of Tokuyama Soda Co., Ltd.) with a mean particle diameter of 2.8 micrometers with the 40 copy by specific surface area ²[of 270 m]/g, and also. The ink jet recording sheet of this invention was produced completely like Example 4, and it examined completely like Example 1 and evaluated. A result is as having been shown in Table 2.

[0046]60 copies of calcium carbonate compound silica whose mean particle diameter specific surface area is 2.8 micrometers in 80-m²/g as example 6. paints (fine seal CM-F: trade name by Tokuyama Soda Co., Ltd.), By specific surface area ²[of 40 m]/g, 40 copies of general formless composition silica with a mean particle diameter of 1.8 micrometers (fine seal SP-20: trade name of Tokuyama Soda Co., Ltd.), 20 copies of colloidal silica (snow textile N: trade name by Nissan chemicals incorporated company), As a binder, 30 copies of styrene butadiene series latex (JSR-0617: trade name by Japan Synthetic Rubber Co., Ltd.), Two copies of calcium stearates (NOPUKOTO C-104: trade name by Sannopuko, Inc.) were respectively added as 30 copies of casein (RAKUCHIKKU casein: trade name from New Zealand), and a release agent, it mixed, and 30% of coating liquid was prepared with solids concentration.

[0047]Coating of the obtained coating liquid was carried out by the roll coater so that it might become the coat stencil paper of basis weight 90 g/m² with 17 g/m² by solid content, and the coating layer was provided. Coating of the solution which contains polyethyleneimine quarternary ammonium salt which is a cationic polymer electrolyte as a water resistance-ized agent 3% was carried out to 10% of calcium formate solution by the roll coater as a coagulant, and coagulation processing was performed to the obtained coated paper.

[0048]Subsequently, while the coating layer of the obtained coated paper was in the damp or wet condition, the mirror plane of the cast drum heated by 100 ** was welded by pressure to the coating layer side, this coating layer was dried, and the ink jet recording sheet of this invention was obtained. Using the obtained record paper, it examined completely like Example 1 and evaluated. A result is as having been shown in Table 1.

[0049]60 copies of calcium carbonate compound silica whose mean particle diameter

specific surface area is 2.8 micrometers in $80\text{-m}^2/\text{g}$ as example 7. paints (fine seal CM-F: trade name by Tokuyama Soda Co., Ltd.), 40 copies of kaolin (UW-90: trade name made from ENGERU HADOEMUANDOSHI, Inc. (Engelhard M&C)), 20 copies of colloidal silica (snow textile N: trade name by Nissan chemicals incorporated company), As a binder, 24 copies of styrene butadiene series latex (JSR-0617: trade name by Japan Synthetic Rubber Co., Ltd.), Two copies of calcium stearates (NOPUKOTO C-104: trade name by Sannopuko, Inc.) were respectively added as 24 copies of casein (RAKUCHIKKU casein: trade name from New Zealand), and a release agent, it mixed, and 40% of coating liquid was prepared with solids concentration.

[0050]Coating of the obtained coating liquid was carried out by the roll coater so that it might become the coat stencil paper of basis weight 90 g/m^2 with 20 g/m^2 by solid content, and the coating layer was provided. Coating of the solution which contains polyethyleneimine quarternary ammonium salt which is a cationic polymer electrolyte as a waterproof agent 3% was carried out to 10% of calcium formate solution by the roll coater as a coagulant, and coagulation processing was performed to the obtained coated paper.

[0051]Subsequently, while the coating layer of the obtained coated paper was in the damp or wet condition, the mirror plane of the cast drum heated by 100°C was welded by pressure to the coating layer side, this coating layer was dried, and the record paper of this invention was obtained. Using the obtained record paper, it examined completely like Example 1 and evaluated. A result is as having been shown in Table 2.

[0052]Specific surface area replaces with 100 copies of calcium carbonate compound silica (fine seal CM-F: trade name by Tokuyama Soda Co., Ltd.) whose mean particle diameter is 2.8 micrometers in $60\text{-m}^2/\text{g}$ as Examples 8, 9, 10, and 11 and 12. paints, 100 copies of calcium carbonate compound silica (fine seal CM-F: trade name by Tokuyama Soda Co., Ltd.) of the following table 1 were used, and also the record paper of this invention was obtained completely like Example 1.

[0053]Using the obtained record paper, it examined completely like Example 1 and evaluated. A result is as having been shown in Table 2.

[Table 1]

例	平均粒子径 (μm)	比表面積 (m^2 / g)
実施例 8	2. 8	8 0
実施例 9	3. 9	8 0
実施例 1 0	6. 7	8 0
実施例 1 1	2. 8	1 0 0
実施例 1 2	2. 8	1 2 0

[0054] Specific surface area replaces with 100 copies of calcium carbonate compound silica (fine seal CM-F: trade name by Tokuyama Soda Co., Ltd.) whose mean particle diameter is 2.8 micrometers in $60\text{-m}^2/\text{g}$ as comparative example 1. paints, 100 copies of general formless composition silica (fine seal X-37B: trade name of Tokuyama Soda Co., Ltd.) with a mean particle diameter of 2.8 micrometers were used by specific surface area 2 of $270\text{ m}^2/\text{g}$, and also the record paper was obtained completely like Example 1. Using the obtained record paper, it examined completely like Example 1 and evaluated. A result is as having been shown in Table 2.

[0055] Specific surface area replaces with 100 copies of calcium carbonate compound silica (fine seal CM-F: trade name by Tokuyama Soda Co., Ltd.) whose mean particle diameter is 2.8 micrometers in $60\text{-m}^2/\text{g}$ as comparative example 2. paints, 100 copies of general formless composition silica (fine seal SP-20: trade name of Tokuyama Soda Co., Ltd.) with a mean particle diameter of 1.8 micrometers were used by specific surface area 2 of $40\text{ m}^2/\text{g}$, and also the record paper was obtained completely like Example 1. Using the obtained record paper, it examined completely like Example 1 and evaluated. A result is as having been shown in Table 2.

[0056] Comparative example 3. specific surface area replaces with the calcium carbonate compound silica (fine seal CM-F: trade name by Tokuyama Soda Co., Ltd.) whose mean particle diameter is 2.8 micrometers in $80\text{-m}^2/\text{g}$, General formless composition silica (fine seal X-37B: trade name of Tokuyama Soda Co., Ltd.) with a mean particle diameter of 2.8 micrometers was used by specific surface area 2 of $270\text{ m}^2/\text{g}$, and also the record paper was obtained completely like Example 2. Using the obtained record paper, it examined completely like Example 1 and evaluated. A result is as having been shown in

Table 2.

[0057]Comparative example 4. specific surface area replaces with the 40 copy 60 copies of calcium carbonate compound silica (fine seal CM-F: trade name by Tokuyama Soda Co., Ltd.) whose mean particle diameter is 2.8 micrometers in 80-m²/g, 40 copies of precipitated calcium carbonate (TAMAPARU 121: trade name by Okutama Industries) was changed into the 60 copy, and also the ink jet recording sheet was produced completely like Example 2, and it examined completely like Example 1 and evaluated. A result is as having been shown in Table 2.

[0058]Comparative example 5. specific surface area replaces with the 40 copy 80 copies of calcium carbonate compound silica (fine seal CM-F: trade name by Tokuyama Soda Co., Ltd.) whose mean particle diameter is 2.8 micrometers in 80-m²/g, 20 copies of general formless composition silica (fine seal X-37B: trade name of Tokuyama Soda Co., Ltd.) with a mean particle diameter of 2.8 micrometers were replaced with the 60 copy by specific surface area ²[of 270 m²/g, and also the record paper was obtained completely like Example 2. Using the obtained record paper, it examined completely like Example 1 and evaluated. A result is as having been shown in Table 2.

[0059]Using the ink jet recording sheet of reference example 1. marketing, it examined completely like Example 1 and evaluated. A result is as having been shown in Table 1. The above-mentioned record paper is a specification paper of the full color ink jet printer used for printing evaluation. From the above result, it was checked that the ink jet recording sheet of this invention has 75-degree specular gloss, smoothness, and good ink absorbency, and it is a record paper which the sharpness and perfect circle nature of a dot are high, and can be recorded by high dot concentration.

[Table 2]

実施例	75度鏡面 光沢度%	インク 吸収性	ドット 濃度	ドット径 μm	円形度 係数	シャープネス
実施例 1	68.1	◎	0.96	68.3	0.73	○
実施例 2	71.5	○	0.78	62.5	0.70	○
実施例 3	69.6	◎	0.86	67.2	0.70	○
実施例 4	70.1	◎	0.88	63.8	0.76	○
実施例 5	69.2	◎	0.83	63.5	0.74	○
実施例 6	75.8	◎	0.85	69.5	0.68	○
実施例 7	92.7	○	0.89	61.2	0.78	○
実施例 8	77.8	◎	0.87	68.1	0.71	○
実施例 9	82.9	◎	0.83	67.9	0.71	○

実施例10	82.1	◎	0.76	68.0	0.69	○
実施例11	79.0	◎	0.83	65.5	0.75	○
実施例12	81.5	◎	0.78	65.0	0.75	○
比較例 1	82.7	◎	0.80	58.7	0.48	△
比較例 2	59.8	○	0.84	71.2	0.56	△
比較例 3	78.2	△	0.73	59.2	0.55	×
比較例 4	72.0	△	0.68	61.9	0.59	×
比較例 5	71.0	◎	0.78	62.0	0.61	△
参考例 1	2.0	◎	0.85	65.1	0.49	△

Abstract:

PURPOSE: To obtain the title paper excellent in ink-absorbability, smoothness gloss, water resistance and roundness of dots, suitable for giving high-precision full-color images by coating the surface(s) of a base paper with a pigment containing at least a specified amount of calcium carbonate-coated silica.

CONSTITUTION: The objective paper can be obtained by coating, through cast coating technique, (A) at least one surface of a base paper with (B) a pigment constituting a coating layer containing ≥ 50 wt.% of calcium carbonate-coated silica $\geq 100 \text{ m}^2/\text{g}$ (pref. $80 \text{ m}^2/\text{g}$ in BET specific surface area and ≥ 4 (pref. ≤ 3) μm in mean particle size. The amount of the pigment to be applied is pref. $3\text{-}30 \text{ g}/\text{m}^2$ on a solid basis per one surface of the base paper.